

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):	Nicholas F. Borrelli et al.)	
)	
)	Group No. 1756
)	
Serial No.:	10/679,089)	Examiner: McPherson, John A.
)	
Filed:	October 3, 2003)	
For:	LENS ARRAY AND METHOD FOR FABRICATING THE LENS ARRAY		

AFFIDAVIT UNDER RULE 1.132

Dr. Nicholas F. Borrelli does say as follows:

That I was appointed Corporate Fellow for Corporate Research and Inorganic Technologies—Science and Technology— at Corning, Incorporated effective January 2007.

That I joined Corning Incorporated's Research and Development Laboratory in 1962 after receiving M.S. and Ph.D. degrees from the University of Rochester.

That I am an inventor or co-inventor of 119 U.S. patents and have authored over 150 technical publications. These publications include a book entitled "Microoptics Technology" which is in its 2nd edition. Plus, I authored several book chapters dealing with quantum dots in glass, photochromic glass, photosensitive glass, and nonlinear optical glasses.

That I have conducted research which has resulted in many commercial products such as Serengeti™ hydrogen-reduced photochromics, Polarcor™ glass polarizers and SMILE™ lens arrays.

That I am currently serving on three industrial advisory boards, at City University of New York, Cornell University and the University of Arizona.

That I am a co-inventor of the aforementioned Patent Application.

That in my opinion the pending Claims 1-3, 7-11, 15-16 and 26-29 in the aforementioned Patent Application contain subject matter that was not taught, disclosed or suggested in the references cited in the Office Action dated November 8, 2006.

That in my opinion it is important to understand that the mechanism by which a lens array and lenses are formed is that the exposed and crystallized region surrounding the circular unexposed glass becomes denser during the crystal development and squeezes the soft unexposed glass (e.g., see FIGURES 3B-3D in patent application). The stress applied to the soft unexposed glass depends on the amount of crystalline material that is formed. This in turn is dependent on the temperature of the thermal treatment where the higher the heat treatment temperature then the more crystal phase in the exposed composite and the more stress that can be applied to the soft unexposed glass. What limits the top temperature of the thermal treatment when making a lens array is the stability of the unexposed glass.

That in my opinion the prior art namely Borrelli (the '877 patent) and Bellman (the '611 patent) pertains to lens arrays which were made from higher silver content photosensitive glasses in which the top heat treatment temperature described was 590-600°C (see col. 4, lines 55-60 in the '877 patent and col. 10, lines 50-60 in the '611 patent). If a temperature higher than this was used, then the unexposed glass constituting the lens would begin to crystallize and the lens surface would begin to degrade. In the present invention we have found that by using a glass composition with a lower silver content (or the use of Au alone) then the glass stability was increased so that one could go to a higher temperature in the heat treatment to say about 615°C without the aforementioned lens degradation. The higher heat treatment temperature permits more crystal phase to form thus more pressure is applied to the soft glass, and consequently more sag height is achieved for the lenses. An added benefit of the greater stability of the unexposed glass, is that less silver is produced during the prolonged ion-exchange treatment thus leaving the lenses clear of color.

That in my opinion the prior art namely Stookey (the '160 patent) pertains to making a photo-machinable glass where there was little or no concern for the resulting transparency of the unexposed glass portion at least when it relates to transparency of micro lenses. The present invention is not related to making a photo-machinable material nor is it concerned with the optimum conditions to bring this about. Instead, the present invention is related to making a lens array and it is concerned with the optimum conditions to maximize sag height and to obtain substantially clear lenses. The Stookey patent

does teach a 700°C heat treatment step which is usable in an HF etching process however this heat treatment step would not be usable to make a lens array since the resulting lenses would be opaque (see col. 4, lines 10-22 in the '160 patent).

Further I sayeth not.


Dr. Nicholas F. Borrelli

State of New York §

§ ss.:

County of Steuben §

On this 6th day of March, before me, a Notary Public in and for the State and County aforesaid, personally appeared, Nicholas F. Borrelli known by me to be the person of the above name who signed and sealed the foregoing instrument, and acknowledged the same to be his own free act and deed.


Notary Public

May 22, 2010
My Commission Expires:

Betty L. Davis
Notary Public, State of New York
Qualified in Steuben County No. 01DA6146735
My Commission Expires May 22, 2010